

## RULE 2.31 SOLVENT CLEANING AND DEGREASING

ADOPTED April 27, 1994

REVISED August 13, 1997

REVISED May 14, 2008

REVISED May 8, 2013

REVISED April 12, 2017

### INDEX

#### 100 GENERAL

- 101 PURPOSE
- 102 APPLICABILITY
- 110 EXEMPTION - GENERAL
- 111 EXEMPTION - SOLVENT REQUIREMENTS
- 112 EXEMPTION - GENERAL PROHIBITIONS
- 113 EXEMPTION - LIMITED AEROSOL
- 114 EXEMPTIONS - AEROSPACE VEHICLE OR COMPONENTS

#### 200 DEFINITIONS

- 201 AEROSOL PRODUCT
- 202 AEROSPACE VEHICLE OR COMPONENTS
- 203 AIRLESS CLEANING SYSTEM
- 204 AIRTIGHT CLEANING SYSTEM
- 205 AIR SOLVENT INTERFACE
- 206 APPLICATION EQUIPMENT
- 207 APPURTENANCES
- 208 ARCHITECTURAL COATINGS
- 209 AQUEOUS CLEANING SOLVENT
- 210 BATCH CLEANING MACHINE
- 211 COLD CLEANING MACHINE
- 212 CONTROL DEVICE
- 213 CURED COATINGS, CURED INKS, AND CURED ADHESIVES
- 214 DEGREASER
- 215 DOCTOR BLADE
- 216 ELECTRICAL APPARATUS COMPONENT
- 217 ELECTRONIC COMPONENT
- 218 EMISSION CONTROL SYSTEM
- 219 EXEMPT COMPOUNDS
- 220 FACILITY
- 221 FLEXOGRAPHIC PRINTING
- 222 FREEBOARD HEIGHT
- 223 FREEBOARD RATIO
- 224 GENERAL WORK SURFACES
- 225 GRAPHIC ARTS
- 226 GRAVURE PRINTING
- 227 HIGH PRECISION OPTICS

228 INTAGLIO PRINTING  
 229 JANITORIAL CLEANING  
 230 LETTERPRESS PRINTING  
 231 LITHOGRAPHIC PRINTING  
 232 LIQUID LEAK  
 233 MAINTENANCE CLEANING  
 234 MANUFACTURING PROCESS  
 235 MEDICAL DEVICE  
 236 NON-ABSORBENT CONTAINERS  
 237 NON-ATOMIZED SOLVENT FLOW  
 238 NON-LEAKING CONTAINERS  
 239 OPEN TOP VAPOR DEGREASER  
 240 PHARMACEUTICAL MANUFACTURING PLANT  
 241 PHARMACEUTICAL PRODUCT  
 242 PRINTING  
 243 PRODUCT CLEANING  
 244 REMOTE RESERVOIR COLD CLEANER  
 245 REPAIR CLEANING  
 246 REPAIR PROCESS  
 247 SCREEN PRINTING  
 248 SEMIAQUEOUS CLEANING SOLVENT  
 249 SOLVENT  
 250 SOLVENT CLEANING MACHINE  
 251 SOLVENT CLEANING OPERATION  
 252 SOLVENT CONTAINER  
 253 SOLVENT DEGREASING OPERATION  
 254 SOLVENT FLUSHING  
 255 STRIPPING  
 256 SURFACE PREPARATION AND CLEANUP  
 257 ULTRAVIOLET INKS  
 258 VAPOR CLEANING MACHINE  
 259 VOLATILE ORGANIC COMPOUND (VOC)  
 260 VOLATILE ORGANIC COMPOUND (VOC) COMPOSITE PARTIAL  
 PRESSURE  
 261 VOLATILE ORGANIC COMPOUND (VOC) CONTENT  
 262 WIPE CLEANING

### 300 STANDARDS

301 SOLVENT CLEANING OPERATIONS  
 302 SOLVENT DEGREASING OPERATIONS  
 303 COLD CLEANER REQUIREMENTS  
 304 OPEN TOP VAPOR DEGREASER REQUIREMENTS  
 305 AIRLESS/AIRTIGHT CLEANING SYSTEM REQUIREMENTS  
 306 REMOTE RESERVOIR COLD CLEANER REQUIREMENTS  
 307 STORAGE AND DISPOSAL - GENERAL  
 308 EMISSION CONTROL SYSTEM

**400 ADMINISTRATIVE REQUIREMENTS**

- 401 PROHIBITION OF SPECIFICATION
- 402 COMPLIANCE STATEMENT REQUIREMENT
- 403 OPERATION & MAINTENANCE PLAN (O&M PLAN)

**500 MONITORING AND RECORDS**

- 501 RECORD KEEPING - GENERAL
- 502 TEST METHODS RECORD KEEPING - EMISSION CONTROL SYSTEM
- 503 BURDEN OF PROOF
- 504 RECORD RETENTION

**600 TEST METHODS AND CALCULATIONS**

- 601 GENERAL
- 602 VOC CONTENT
- 603 EXEMPT COMPOUNDS
- 604 CALCULATION OF VOC CONTENT
- 605 CALCULATION OF VOC COMPOSITE PARTIAL PRESSURE
- 606 CAPTURE EFFICIENCY
- 607 CONTROL EFFICIENCY
- 608 SPRAY GUN CLEANING SYSTEMS

## 100 GENERAL

- 101 **PURPOSE:** The purpose of this Rule is to limit the emissions of volatile organic compounds (VOC) from solvent cleaning operations and solvent degreasing operations, and from the storage and disposal of materials used for such operations.
- 102 **APPLICABILITY:** The provisions of this Rule applies to any owner or operator of any facility that uses VOC-containing materials for solvent cleaning or solvent degreasing, or any person who sells or distributes any solvent subject to the provisions of this rule.
- 110 **EXEMPTION - GENERAL:** The provisions of this rule, except for Section 503, Burden of Proof, shall not apply to the following:
- 110.1 Dry cleaning operations.
  - 110.2 Cleaning operations using a solvent containing no more than 25 grams of VOC per liter of material.
  - 110.3 Janitorial cleaning.
  - 110.4 Stripping of cured coatings, cured adhesives, and cured inks.
  - 110.5 Degreasers with an open top surface area of 1.0 square foot or less or with a capacity of 1.0 gallons or less, using unheated nonhalogenated solvent exclusively, where the reservoir is covered when not processing work.
  - 110.6 Any solvent degreasing operations that are subject to the NESHAP requirements of 40 CFR Part 63 Subpart T- National Emission Standards for Halogenated Solvent Cleaning.
  - 110.7 Cleaning operations in printing pre-press or graphic arts pre-press areas, including the cleaning of film processors, color scanners, plate processors, film cleaning, and plate cleaning.
- 111 **EXEMPTION - SOLVENT REQUIREMENTS:** The provisions of Section 301 shall not apply to any of the following applications, provided that the facility has obtained either a District permit, or written exemption from the APCO:
- 111.1 Wipe cleaning of solar cells, laser hardware, and high precision optics.
  - 111.2 Wipe cleaning for performance laboratory tests on coatings, adhesives or inks, research and development programs, and laboratory tests in quality assurance laboratories.

- 111.3 Wipe cleaning of polycarbonate plastics.
- 111.4 Cleaning of cotton swabs to remove cottonseed oil before cleaning of high precision optics.
- 111.5 Facilities using 10 gallons or less of solvents (total of compliant and noncompliant) in any one calendar year provided the daily use does not exceed one liter in any one day.
- 111.6 Cleaning of paper-based gaskets, and clutch assemblies where rubber is bonded to metal by means of an adhesive.
- 111.7 Cleaning of sterilization ink indicating equipment provided that the solvent usage is less than 1.5 gallons per day.
- 111.8 Cleaning of coating and adhesive application processes utilized to manufacture transdermal drug delivery product using less than 3.0 gallons per day of ethyl acetate, averaged over a calendar month period.

111.9 Facility wide use of less than 1.0 gallon per week of non-compliant solvent where compliant solvents are not available.

- 112 **EXEMPTION - GENERAL PROHIBITION:** The provisions of Section 301.4 shall not apply to any of the following applications:

- 112.1 Internal cleaning of the tips of automated spray equipment systems, except for robotic systems.
- 112.2 Spray bottles or containers described in Section 301.2.b. of this rule.
- 112.3 Printing operations where the roller or blanket wash is applied automatically.

- 113 **EXEMPTION - LIMITED AEROSOL:** The provisions of Sections 301 shall not apply to cleaning with aerosol products if 160 ounces or less are used per day per facility and the facility has obtained either a District permit, or a written exemption from the APCO. The products used shall comply with California Air Resources Board (ARB) regulations.

- 114 **EXEMPTIONS – AEROSPACE VEHICLE OR COMPONENTS:**

- 114.1 The provisions of section 307 shall not apply to cotton-tipped swabs used for very small cleaning operations nor to aqueous cleaning solvents.
- 114.2 The provisions of section 301 shall not apply to the following:
  - a. Cleaning during the manufacture, assembly, installation,

- maintenance, or testing of components of breathing oxygen systems that are exposed to the breathing oxygen;
- b. Cleaning during the manufacture, assembly, installation, maintenance, or testing of parts, subassemblies, or assemblies that are exposed to strong oxidizers or reducers (e.g., nitrogen tetroxide, liquid oxygen, hydrazine);
  - c. Cleaning and surface activation prior to adhesive bonding;
  - d. Cleaning of electronics and assemblies containing electronics;
  - e. Cleaning of aircraft and ground support equipment fluid systems that are exposed to the fluid, including air-to-air heat exchangers and hydraulic fluid systems;
  - f. Cleaning of fuel cells, fuel tanks, and confined spaces;
  - g. Surface cleaning of solar cells, coated optics, and thermal control surfaces;
  - h. Cleaning during fabrication, assembly, installation, and maintenance of upholstery, curtains, carpet, and other textile materials used on the interior of the aircraft;
  - i. Cleaning of metallic and nonmetallic materials used in honeycomb cores during the manufacture or maintenance of these cores, and cleaning of the completed cores used in the manufacture of aerospace vehicles or components;
  - j. Cleaning of aircraft transparencies, polycarbonate, or glass substrates;
  - k. Cleaning and solvent usage associated with research and development, quality control, or laboratory testing;
  - l. Cleaning operations using nonflammable liquids conducted within 5 feet of energized electrical systems. Energized electrical systems means any AC or DC electrical circuit on an assembled aircraft once electrical power is connected, including interior passenger and cargo areas, wheel wells and tail sections; and
  - m. Cleaning operations identified in essential uses Montreal Protocol for which the Administrator has allocated essential use allowance exemptions in 40 CFR 82.4.

114.3 The provisions of section 301.2.c and 301.2.d. shall not apply to semiaqueous or aqueous cleaning solvents.

## 200 DEFINITIONS

- 201 **AEROSOL PRODUCT:** A hand-held, non-refillable container which expels pressurized product ingredients by means of a manual propellant-induced force.
- 202 **AEROSPACE VEHICLE OR COMPONENTS:** Any fabricated part, processed part, assembly of parts, or completed unit, with the exception of electronic

components, of any aircraft, including but not limited to airplanes, helicopters, missiles, rockets, and space vehicles.

- 203    **AIRLESS CLEANING SYSTEM:** A degreaser that is automatically operated and seals at an absolute internal pressure of 0.02 psia or less, prior to the introduction of solvent vapor into the cleaning chamber, and maintains differential pressure under vacuum during all cleaning and drying cycles.
- 204    **AIRTIGHT CLEANING SYSTEM:** A degreaser that is automatically operated and seals at a differential pressure no greater than 0.5 psig during all cleaning and drying operations.
- 205    **AIR SOLVENT INTERFACE:** The point of contact between the exposed solvent and air.
- 206    **APPLICATION EQUIPMENT:** A device used to apply adhesive, coating, ink, or polyester resin material, such as but not limited to brushes, rollers and spray guns.
- 207    **APPURTENANCES:** Accessories to an architectural structure, including, but not limited to: Hand railings, cabinets, bathroom and kitchen fixtures, fences, rain-gutters and down-spouts, window screens, lamp-posts, heating and air conditioning equipment, other mechanical equipment, large fixed stationary tools and concrete forms.
- 208    **ARCHITECTURAL COATINGS:** Any coatings applied to stationary structures and their appurtenances, to mobile homes, to pavements, or to curbs.
- 209    **AQUEOUS CLEANING SOLVENT:** A solvent in which water is at least 80 percent of the solvent as applied.
- 210    **BATCH CLEANING MACHINE:** A solvent cleaning machine in which individual parts or a set of parts move through the entire cleaning cycle before new parts are introduced into the solvent cleaning machine. An open-top vapor cleaning machine is a type of batch cleaning machine. A solvent cleaning machine, such as a ferris wheel or a cross-rod degreaser, that clean multiple batch loads simultaneously and are manually loaded are batch cleaning machines.
- 211    **COLD CLEANING MACHINE:** Any device or piece of equipment that contains and/or uses liquid solvent, into which parts are placed to remove soils from the surfaces of the parts or to dry the parts. Cleaning machines that contain and use heated, nonboiling solvent to clean the parts are classified as cold cleaning machines.
- 212    **CONTROL DEVICE:** Equipment such as an incinerator or adsorber used to prevent air pollutants from reaching the ambient air.



- 213 **CURED COATINGS, CURED INKS, AND CURED ADHESIVES:** Coatings, inks, and adhesives which are dry to the touch.
- 214 **DEGREASER:** A tank, tray, drum, or other container in which objects to be cleaned are placed in to be exposed to a solvent or solvent vapor, in order to remove contaminants. The objects to be cleaned include, but are not limited to, parts, products, tools, machinery, and equipment.
- 215 **DOCTOR BLADE:** A blade used to scrape excess ink from a printing plate.
- 216 **ELECTRICAL APPARATUS COMPONENT:** An internal component such as wires, windings, stators, rotors, magnets, contacts, relays, energizers, and connections in an apparatus that generates or transmits electrical energy including, but not limited to: alternators, generators, transformers, electric motors, cables, and circuit breakers, except for the actual cabinet in which the components are housed. Electrical components of graphic arts application equipment and hot-line tools are also included in this category.
- 217 **ELECTRONIC COMPONENT:** The portion of an assembly, including circuit card assemblies, printed wire assemblies, printed circuit boards, soldered joints, ground wires, bus bars, and other electrical fixtures, except for the actual cabinet in which the components are housed.
- 218 **EMISSION CONTROL SYSTEM:** A control device and its associated collection system.
- 219 **EXEMPT COMPOUNDS:** As defined in Rule 1.1, General Provisions and Definitions.
- 220 **FACILITY:** A business or businesses engaged in surface preparation and clean up activities which are owned or operated by the same person or persons and are located on the same or contiguous parcels.
- 221 **FLEXOGRAPHIC PRINTING:** A letterpress method utilizing flexible rubber or other elastomeric plate and rapid drying liquid inks.
- 222 **FREEBOARD HEIGHT:** The distance from the top of the solvent or solvent drain to the top of the tank for batch loaded cold cleaners.
- 223 **FREEBOARD RATIO:** The freeboard height divided by the width of the degreaser.
- 224 **GENERAL WORK SURFACE:** An area of a medical device or pharmaceutical facility where solvent cleaning is performed on work surfaces including, but not limited to, tables, countertops, and laboratory benches. General work surfaces shall not include items defined under janitorial cleaning.



- 225    **GRAPHIC ARTS:** All screen, gravure, letterpress, flexographic, and lithographic printing processes.
- 226    **GRAVURE PRINTING:** An intaglio printing process in which the ink is carried in minute etched or engraved wells on a roll or cylinder. The excess ink is removed from the surface by a doctor blade.
- 227    **HIGH PRECISION OPTICS:** An optical element used in an electro-optical device that is designed to sense, detect, or transmit light energy, including specific wavelengths of light energy and changes in light energy levels.
- 228    **INTAGLIO PRINTING:** A printing operation done from a plate in which the image is etched or engraved into the surface.
- 229    **JANITORIAL CLEANING:** The cleaning of building or facility components, such as the floor, ceiling, walls, windows, doors, stairs, bathrooms, furnishings, and exterior surfaces of office equipment. The cleaning of work areas where manufacturing or repair activity is performed is excluded from this definition.
- 230    **LETTERPRESS PRINTING:** The method in which the image area is raised relative to the nonimage area and the ink is transferred to the paper directly from the image surface.
- 231    **LITHOGRAPHIC PRINTING:** A printing operation in which the image and non-image areas exist in the same plane. The non-image area is treated chemically so that only the image area will be printed onto the substrate.
- 232    **LIQUID LEAK:** A visible liquid solvent leak from a container at a rate of more than three (3) drops per minute, or a visible liquid mist.
- 233    **MAINTENANCE CLEANING:** Surface preparation and cleanup, including sanitization, carried out to keep parts, products, tools, machinery, equipment, or general work areas in clean and good operational condition.
- 234    **MANUFACTURING PROCESS:** The process of making goods or articles by hand or by machinery.

- 235 **MEDICAL DEVICE:** Any instrument, apparatus, implement, machine contrivance, implant, in vitro reagent or other similar article, including any component or accessory, that meets one of the following conditions:
- 235.1 It is intended for use in the diagnosis of disease or other conditions, or in the cure, mitigation, treatment, or prevention of disease: or
- 235.2 It is intended to affect the structure or any function of the body; or
- 235.3 It is defined in the National Formulary or the United States Pharmacopia, or any supplement to them.
- 236 **NON-ABSORBENT CONTAINERS:** Containers made of nonporous material which do not allow the migration of the liquid solvent through them.
- 237 **NON-ATOMIZED SOLVENT FLOW:** The use of a solvent to remove uncured adhesives, uncured inks, uncured coatings, and contaminants from an article in the form of a liquid stream without atomization.
- 238 **NON-LEAKING CONTAINERS:** Containers without liquid leaks.
- 239 **OPEN TOP VAPOR DEGREASER:** A batch solvent cleaning machine that has its upper surface open to the air and boils solvent to create solvent vapor used to clean and/or dry parts.
- 240 **PHARMACEUTICAL MANUFACTURING PLANT:** Any plant producing or blending chemicals for use in pharmaceutical products and/or employing chemical processes in the manufacture of pharmaceutical products or medical devices. Any facility or operation that has 283 as the first three digits of their Standard Industrial Classification Code. Pharmaceutical manufacturing plants may include, but are not limited to, establishments primarily engaged in manufacturing, fabricating, or processing medicinal chemicals and pharmaceutical products for human or veterinary use.
- 241 **PHARMACEUTICAL PRODUCT:** A preparation or compound of medicinal drugs including, but not limited to, a prescription drug, analgesic, decongestant, antihistamine, cough suppressant, vitamin, mineral and herb, and is used by humans for consumption to enhance human health.
- 242 **PRINTING:** Any operation in the graphic arts that imparts color, design, alphabet, or numerals on a substrate.
- 243 **PRODUCT CLEANING:** The removal of loosely held uncured adhesives, uncured inks, uncured coatings, and contaminants such as dust, soil, oil, grease,

etc., from the product or substrate during any manufacturing process, adhesive application, coating application or ink application.

- 244    **REMOTE RESERVOIR COLD CLEANER:** A cleaning device, such as a parts washer, in which liquid solvent is pumped from a solvent container to a sink-like work area and the solvent from the sink-like area drains into an enclosed solvent container while parts are being cleaned.
- 245    **REPAIR CLEANING:** Surface preparation and cleanup carried out during a repair process.
- 246    **REPAIR PROCESS:** The process of returning a damaged object or an object not operating properly to good condition.
- 247    **SCREEN PRINTING:** A process in which the printing ink passes through a web or fabric to which a refined form of stencil has been applied. The stencil openings determine the form and dimensions of the imprint.
- 248    **SEMI-AQUEOUS CLEANING SOLVENT:** A solution in which water is a primary ingredient ( $\geq 60$  percent of the solvent solution as applied must be water).
- 249    **SOLVENT:** Any liquid containing a volatile organic compound or combination of volatile organic compounds, which is used to as a diluent, thinner, dissolver, viscosity reducer, cleaning agent, or for other similar uses.
- 250    **SOLVENT CLEANING MACHINE:** Any device or piece of equipment that uses solvent liquid or vapor to remove soils from the surfaces of materials. Types of solvent cleaning machines include, but are not limited to, batch vapor, in-line vapor, in-line cold, and batch cold solvent cleaning machines. Buckets, pails, and beakers with capacities of 7.6 liters (2 gallons) or less are not considered solvent cleaning machines.
- 251    **SOLVENT CLEANING OPERATION:** An activity, or operation, or process, (including surface preparation, cleanup, or wipe cleaning), performed outside of a degreaser, that uses organic solvent to remove uncured adhesives, uncured coatings, uncured inks or other contaminants, including, but not limited to, dirt, soil, oil, lubricants, coolants, moisture, fingerprints, and grease, from parts, products, tools, machinery, application equipment and general work areas. Cleaning spray equipment used for the application of coatings, adhesives, or inks, is also considered to be solvent cleaning.
- 252    **SOLVENT CONTAINER:** That part of a cleaning device that holds the solvent.
- 253    **SOLVENT DEGREASING OPERATION:** Any cleaning activities which occur within a degreaser. Cleaning of ink, coating, or adhesive application equipment, and stripping of coatings are not considered solvent degreasing operations.

Solvent degreasing operations and solvent cleaning operations are mutually exclusive.

- 254 **SOLVENT FLUSHING:** The use of solvent to remove uncured adhesives, uncured inks, uncured coatings, or contaminants from the internal surfaces and passages of the equipment by flushing solvent through the equipment.
- 255 **STRIPPING:** The removal of cured inks, cured adhesives, and cured coatings.
- 256 **SURFACE PREPARATION AND CLEANUP:** The removal of loosely held uncured adhesives, uncured inks, uncured coatings, and contaminants such as dust, soil, oil, grease, etc., at any step in the production, repair, maintenance, or servicing of parts, products, tools, machinery, equipment, or general work areas including the storage and disposal of VOC containing materials used.
- 257 **ULTRAVIOLET INKS:** Inks which dry by a polymerization reaction induced by ultraviolet radiation.
- 258 **VAPOR CLEANING MACHINE:** A batch or in-line solvent cleaning machine that boils liquid solvent generating solvent vapor that is used as a part of the cleaning or drying cycle.
- 259 **VOLATILE ORGANIC COMPOUND (VOC):** As defined in Rule 1.1, General Requirements.
- 260 **VOLATILE ORGANIC COMPOUND (VOC) COMPOSITE PARTIAL PRESSURE:** The sum of the partial pressures of the compounds defined as VOCs. VOC composite partial pressure is calculated according to Section 605.
- 261 **VOLATILE ORGANIC COMPOUND (VOC) CONTENT:** The weight of VOC per volume of material as calculated pursuant to the applicable Sections of 600.
- 262 **WIPE CLEANING:** The method of cleaning a surface by physically rubbing it with a material such as a rag, paper, or a cotton swab moistened with a solvent.

### 300 STANDARDS

- 301 **SOLVENT CLEANING OPERATIONS:** Any person performing solvent cleaning operations shall comply with all the following:
- 301.1 **VOC CONTENT LIMITS:** A person shall not use a solvent, or specify or require any person to use a solvent subject to the provisions of this Rule, unless the solvent complies with the applicable requirements set forth in Table 1.

**TABLE 1. VOC CONTENT LIMITS**

Category			VOC Content* Limit grams/liter (g/L)
Product Cleaning	Electrical Apparatus Components & Electronic Components		100
	Medical Devices and Pharmaceuticals		800
	Aerospace Vehicle or Component		200 g/L or 45 mmHg
	All other		25
Repair Cleaning & Maintenance Cleaning	General		25
	Electrical Apparatus Components & Electronic Components		100
	Aerospace Vehicle or Component		200 g/L or 45 mmHg
	Medical Devices and Pharmaceuticals	Tools, Equipment, Machinery	800
		General Work Surfaces	600
Cleaning of Application Equipment	Printing operations	Screen Printing	100
		Lithographic and Letterpress	238
		Ultraviolet (except screen printing)	<del>100</del> 238
		Specialty Flexographic	100
		Gravure (Publication)	100
		General	25
	Medical Devices and Pharmaceuticals		810
	Aerospace Vehicle or Component		200 g/L or 45 mmHg
	All other		25
General	Industries Not Specified Above		25

\* For aerospace vehicle or components, the solvent must comply with either the VOC Content limit in grams/Liter (g/L) or the VOC Composite Partial Pressure limit in millimeters mercury (mmHg)

**301.2 CLEANING METHODS:** A person using a solvent above 25 grams/liter (in one of the above allowed categories) shall use one of the following cleaning devices or methods:

- a. Wipe cleaning;

- b. Spray bottles or closed containers ~~with a maximum capacity of 16 fluid ounces~~ from which solvents are applied without a propellant induced force;
- c. Non-atomized solvent flow method where the cleaning solvent is collected in a container or a collection system which is closed except for solvent collection openings and, if necessary, openings to avoid excessive pressure build-up inside the container; or
- d. Solvent flushing method where the cleaning solvent is discharged into a container which is closed except for solvent collection openings and, if necessary, openings to avoid excessive pressure build-up inside the container. The discharged solvent from the equipment must be collected into containers without atomizing into the open air. The solvent may be flushed through the system by air or hydraulic pressure, or by pumping.

301.3 **APPLICATION EQUIPMENT CLEANUP:** A person shall not use solvent to clean application equipment unless an enclosed system (or equipment that is proven to be equally effective at controlling emissions) is used for cleaning. If an enclosed system is used, it must totally enclose spray guns, cups, nozzles, bowls, and other parts during washing, rinsing and draining procedures, it must be used according to the manufacturer's recommendations, and it must be closed when not in use.

301.4 **GENERAL PROHIBITION:** A person shall not atomize any solvent into the open air.

302 **SOLVENT DEGREASING OPERATIONS:** Any person performing solvent degreasing operations shall comply with all of the following:

302.1 **GENERAL REQUIREMENTS:**

- a. An operator shall operate and maintain the degreaser equipment and emission control equipment in proper working order;
- b. An operator shall not remove or open any device designed to cover the solvent unless processing work in the degreaser or performing maintenance on the degreaser;
- c. An operator shall not degrease porous or absorbent materials such as cloth, leather, wood, or rope;
- d. An operator shall, upon detection of a solvent leak, repair the solvent leak immediately, or shut down and drain the degreaser;
- e. An operator shall use only a continuous fluid stream (not a fine, atomized, fan, or shower type spray) at a pressure which does not cause liquid solvent to splash outside of the solvent container, if a solvent flow is utilized;
- f. An operator shall store or dispose of spent solvents, waste solvent cleaning materials such as cloth, paper, etc., in closed,



non-absorbent and non-leaking containers. The containers shall remain closed at all times except when depositing or removing the contents of the containers or when the container is empty;

302.2 **CLEANING METHOD:** Use one of the following;

- a. Use solvents < 25 grams/liter;
- b. A cold cleaner that meets the requirements of section 303;
- c. An open top vapor degreaser that meets the requirements of section 304;
- d. Airless/airtight cleaning equipment that meets the requirements of section 305; or
- e. A remote reservoir cold cleaner that meets the requirements of section 306

303 **COLD CLEANER REQUIREMENTS:** A cold cleaner shall meet all of the following:

- 303.1 An apparatus or cover must be used which prevents the solvent from evaporating when not processing work in the degreaser. The cover should be designed so that it can be opened and closed easily with one hand;
- 303.2 If the solvent initial boiling point is less than 248°F and the solvent is heated above 122°F then the cold cleaner shall have
  - a. A freeboard ratio greater or equal to 0.75; or
  - b. A water cover if the solvent is insoluble in and heavier than water;
- 303.3 If the solvent initial boiling point is less than 248°F then the drainage facility must be internal so that the parts are enclosed under the cover while draining. The drainage facility may be external for applications where an internal type cannot fit the cleaning system;
- 303.4 A facility for draining cleaned parts such that the drained solvent is returned to the container. Drain cleaned parts for at least 15 seconds after cleaning or until dripping ceases;
- 303.5. If using a solvent flow use only a continuous, fluid stream (not a fine, atomized, or shower type spray) at a pressure which does not cause liquid solvent to splash outside the solvent container;
- 303.6. Perform solvent agitation, where necessary, through pump re-circulation, ultrasonics, or by means of a mixer. Do not use agitation of the solvent bath;
- 303.7. A permanent, conspicuous label posted on or near the degreaser which lists each of the operating requirements in Section 303; and



303.8. A permanent conspicuous mark locating the maximum allowable solvent level that conforms to the freeboard requirement in Section 303.2.

304 **OPEN TOP VAPOR DEGREASER REQUIREMENTS:** An open top vapor degreaser shall meet all of the following requirements:

304.1 Workloads shall not occupy more than half of the degreaser's open top area;

304.2 Solvent spraying shall be done at least four (4) inches below the top of the vapor layer, and solvent flow shall be directed downward to avoid turbulence at the air-vapor interface and to prevent liquid solvent from splashing out of the degrease;

304.3 Water shall not be visually detectable in the solvent returning from the water separator to the solvent cleaner;

304.4 For open-top vapor degreasers equipped with a lip exhaust, the exhaust shall be turned off when the degreaser is covered;

304.5 If the unit is equipped with a refrigerated freeboard chiller, or a primary condenser, or both, the following procedures shall be followed:

- a. When starting up the degreaser, the cooling system shall be turned on before, or simultaneously with, the sump heater; and
- b. When shutting down the degreaser, the sump heater shall be turned off before, or simultaneously with, the cooling system;

304.6 Exhaust ventilation should not exceed 65 cfm/ft<sup>2</sup> of degreaser open area, unless necessary to meet Occupational Safety & Health Administration (OSHA) requirements. Ventilation fans shall not be positioned in such a way to disturb the vapor zone;

304.7 The vertical speed of a powered hoist for an open-top vapor degreaser, shall be not more than 2.2 inches/sec when moving parts in and out of the degreaser; and

304.8 The work load shall be degreased in the vapor zone until condensation ceases.

304.9 Open-top vapor degreasers shall be equipped with a cover designed such that it can be opened and closed easily without disturbing the vapor zone.

304.10 Open-top vapor degreasers shall be equipped with:

- a. A freeboard with a freeboard ratio of at least 1.0.
- b. A container (degreaser) for the solvent and the articles being cleaned;

- c. An apparatus or cover which prevents the solvent from evaporating when not processing work in the degreaser;
- d. A facility for draining cleaned parts such that the drained solvent is returned to the container;
- e. A permanent, conspicuous label posted on or near the degreaser which lists each of the operating requirements in Section 302.1 and Section 304; and
- f. A permanent conspicuous mark locating the maximum allowable solvent level, that conforms to the freeboard requirement in Section 301.10.a.
- g. An automated parts handling system;
- h. Primary condensing coils;
- i. A perimeter trough;
- j. A water separator;
- k. A refrigerated freeboard chiller that is operated such that the chilled air blanket temperature measured at the center of the air blanket is no greater than 40 percent of the boiling point of the solvent, and;
- l. A superheated vapor zone.

304.11 Open-top vapor degreasers shall not operate without one (1) of the following or a combination of the following major control devices:

- a. Condenser equipment where the chilled air blanket temperature measured in degrees F at the coldest point on the vertical axis in the center of the degreaser shall be either no greater than 30 percent of the initial boiling point, measured in degrees F, of the solvent used, or 41°F;
- b. Enclosed design (cover or door opens only when the dry part is actually entering or exiting the degreaser);
- c. A carbon adsorption system which ventilates the air-vapor interface at a minimum rate of 50 cfm/ft<sup>2</sup> of degreaser opening, but not greater than 65 cfm/ft<sup>2</sup> of degreaser opening, unless required by OSHA standards, and exhausts less than 25 ppm of solvent by volume over a complete adsorption cycle, and with an overall capture and control efficiency of 85 percent; or
- d. Any other system of emission control demonstrated to have an overall capture and control efficiency of at least 85 percent.

304.12 Open-top vapor degreasers shall include all of the following safety switches:

- a. A vapor level control switch
- b. A condenser flow switch with a solvent temperature indicator, except where non-water refrigerant is used. The switch shall shut off the sump heat if either the condenser coolant stops circulating or becomes warmer than specified;
- c. A spray pump safety switch; and

- d. A manual reset vapor level thermostat with a solvent temperature indicator.
- 305 **AIRLESS/AIRTIGHT CLEANING SYSTEM REQUIREMENTS:** An airless/airtight cleaning system shall meet all of the following requirements:
- 305.1 The equipment is operated in accordance with the manufacturer's specifications and operated with a door or other pressure sealing apparatus that is in place during all cleaning and drying cycles;
  - 305.2 All associated pressure relief devices shall not allow liquid solvents to drain out. Spills during solvent transfer shall be wiped up immediately and handled in accordance with Section 307.
  - 305.3 A differential pressure gauge shall be installed to indicate the sealed chamber pressure.
- 306 **REMOTE RESERVOIR COLD CLEANER REQUIREMENTS:** A remote reservoir cold cleaner shall meet all the following requirements:
- 306.1 Prevent solvent vapors from escaping from the solvent container by using such devices as a cover or a valve when the remote reservoir is not being used, cleaned, or repaired;
  - 306.2 Direct solvent flow in a manner that will prevent liquid solvent from splashing outside of the remote reservoir cold cleaner;
  - 306.3 A tank or sink-like work area which is sloped sufficiently to preclude pooling of solvent;
  - 306.4 A single drain hole, less than 100 square centimeters (15.5 square inches) in area, for the solvent to flow from the sink into the enclosed reservoir;
  - 306.5 A freeboard ratio greater or equal to 0.75;
  - 306.6 A cover for the drain when no work is processed.
- 307 **STORAGE AND DISPOSAL - GENERAL:** All solvents used, whether in its form for intended use or as a waste or used product, including items such as cloth or paper laden with VOC containing materials, shall be stored in non-absorbent, non-leaking containers which shall be kept closed at all times, except when filling or emptying, and disposed of in a manner to prevent evaporation of VOCs into the atmosphere at the facility.
- 308 **EMISSION CONTROL SYSTEM:** In lieu of complying with the requirements in Sections 301 through 306 of this Rule, an operator may comply by using collection

and control systems provided that the system is approved in writing by the APCO and during emission producing activities, the system complies with either:

308.1 The VOC emission control system's control device shall have a capture efficiency of at least 90 percent, by weight, of the emissions generated by surface preparation and cleanup and one of the following requirements:

- a. The control device has a control efficiency of at least 95 percent by weight, or
- b. The VOC emission control system has an output of less than 50 parts per million by weight (ppm) calculated as carbon with no dilution; or

308.2 The emission control system meets the requirements of the applicable source specific rule of the District's Regulation II.

#### 400 ADMINISTRATIVE REQUIREMENTS

401 **PROHIBITION OF SPECIFICATION:** A person shall not specify the use of any solvent used for surface preparation and cleanup subject to the provisions of this rule that does not meet the limits and requirements of this rule where such applications result in a violation of this rule. The requirements of this Section shall apply to all written or oral contracts.

402 **COMPLIANCE STATEMENT REQUIREMENT:** Any person who sells or distributes any solvent subject to this rule shall make available to the purchaser at the time of sale the following information:

402.1 The name of the solvent;

402.2 The name of the manufacturer;

402.3 The maximum VOC content of the solvent as applied. The VOC content shall be expressed as grams of VOC per liter of solvent, or pounds of VOC per gallon of solvent as determined pursuant to Section 602;

402.4 Recommendations regarding thinning, reducing or mixing with any solvent, if applicable;

403 **OPERATION AND MAINTENANCE PLAN (O&M PLAN):** Any person using an emission control device pursuant to Section 308 of this Rule, as a means of complying with this rule, must submit with the application for Authority to Construct, pursuant to Rule 3.1, GENERAL PERMIT REQUIREMENTS, an O&M Plan for the emission control device to the APCO for approval. The O&M

Plan shall specify operation and maintenance procedures which will demonstrate continuous operation of the control device during periods of emission producing operations. The O&M Plan shall be maintained and re-submitted for approval by the APCO if changes to the control system require changing the plan. The O&M Plan shall also specify which records must be kept to document these operation and maintenance procedures. These records shall comply with the requirements of Section 502 of this Rule. Any person using an emission control device must fully comply with all O&M Plans submitted for approval, even if such O&M Plans have not yet been approved, unless notified in writing by the APCO.

## **500 MONITORING AND RECORDS**

**501 RECORD KEEPING - GENERAL:** Any person using a solvent for all applications subject to this Rule, except those subject to Section 110 Exemption - General, shall maintain records in a current file that contains all the data necessary to verify compliance and shall include the following:

501.1 Identification of each process at the facility subject to this Rule. The identification shall include the following:

- a. The location of the unit(s);
- b. The permit number (if applicable);
- c. Description of the method of application and substrate type.

501.2 The amount and type of each solvent used at each process, on a monthly basis. The following information should be included;

- a. The name of the solvent;
- b. The name of the solvent manufacturer;
- c. The VOC content of the solvent expressed in grams/liter or lb/gallon;
- d. Solvent usage;
- e. The mix ratio for the cleaning solvent as applied.

501.3 A copy of the Manufacturer's product data sheet or material safety data sheet of the solvent used.

501.4 Any other such records needed to verify compliance with this rule.

**502 RECORD KEEPING - EMISSION CONTROL SYSTEMS:** If compliance with this rule is achieved through the use of an emission control system, in addition to the provisions of Section 501, the owner or operator shall maintain:

502.1 Daily usage records of all solvents.

502.2 Daily records of key operating parameters such as temperatures, pressures, flowrates, and hours of operation of the control device to verify compliance of the capture and control device.

502.3 Maintenance work which interferes with the operation of the control device.

503 **BURDEN OF PROOF:** Any person claiming exemption pursuant to Section 110, 111, 112 or 113 shall have information available such as product data or material safety data sheets or records that would allow the APCO to verify the eligibility of the exemption.

504 **RECORD RETENTION:** All records required by Sections 501, 502, and 503 shall be maintained on site for a period of five ~~two~~ years and made available to the APCO upon request.

## 600 TEST METHODS AND CALCULATIONS

601 **GENERAL:** For the purposes of this Rule, the following test methods or calculation methods shall be used. Other test methods determined to be equivalent and approved in writing by the District and the EPA may also be used. When more than one test method or set of test methods is specified for any testing, a violation of any requirement of this rule established by any one of the specified test methods or set of test methods shall constitute a violation of this Rule.

602 **VOC CONTENT:** The VOC content of organic solvents subject to the provisions of this rule shall be determined by:

602.1 procedures contained in EPA Reference Test Method 24 or 24A,

602.2 South Coast Air Quality Management District (SCAQMD) Method 304-91 "Determination of VOC in Various Materials", February 1996; or

602.3 by using the manufacturer's product formulation data and formula listed in Section 604.

603 **EXEMPT COMPOUNDS:** The content of exempt VOCs shall be determined by using CARB Method 432 ('Determination of Dichloromethane and 1,1,1-Trichloroethane in Paints and Coatings', or 'Exempt Halogenated VOC in Liquids') or SCAQMD Method 303-91 (Determination of Exempt Compounds).

604 **CALCULATION OF VOC CONTENT:** The VOC content per volume of solvent shall be calculated by the following equation:

$$VOC_{con} = \frac{(W_S - W_W - W_{ES})}{V_M}$$

where:

$VOC_{con}$  = Grams of VOC per liter of material

$W_S$  = Weight of volatile compounds in grams

$W_W$  = Weight of water in grams

$W_{ES}$  = Weight of exempt compounds in grams

$V_M$  = Volume of material in liters



- 605 **CALCULATION OF VOC COMPOSITE PARTIAL PRESSURE:** The VOC composite partial pressure shall be calculated by the following equation:

$$PP_C = \frac{\sum_{i=1}^n \frac{(W_i)(VP_i)}{MW_i}}{\frac{W_W}{MW_W} + \frac{W_E}{MW_E} + \sum_{i=1}^n \frac{W_i}{MW_i}}$$

where:

$PP_C$  = VOC composite partial pressure at 20°C, in mm Hg  
 $VP_i$  = Vapor pressure of the "i"th VOC compound at 20°C, in mm Hg  
 $W_i$  = Weight of the "i"th VOC compound, in grams  
 $W_W$  = Weight of water, in grams  
 $W_E$  = Weight of exempt compound, in grams  
 $MW_i$  = Molecular weight of the "i"th VOC compound, in g/(g-mole)  
 $MW_W$  = Molecular weight of water, in g/(g-mole)  
 $MW_E$  = Molecular weight of exempt compound, in g/(g-mole)

- 606 **CAPTURE EFFICIENCY:** The capture efficiency of a VOC emission control system's collection device shall be determined according to EPA's "Guidelines for Determining Capture Efficiency," January 9, 1995 and 40 CFR 51, Appendix M, Methods 204-204F, as applicable. If a permanent total enclosure is used, EPA Method 204 can also be used as an alternative method to determine capture efficiency.
- 607 **CONTROL EFFICIENCY:** The control efficiency a VOC emission control system's collection device shall be determined by using EPA Methods 2, 2A, or 2D for measuring flow rates and EPA Method 25, 25A, or 25B for measuring total gaseous organic concentrations at the inlet and outlet of the control device. EPA Method 18 or CARB Method 422 shall be used to determine the emissions of exempt compounds.
- 608 **SPRAY GUN CLEANING SYSTEMS:** The determination of emissions of VOC from spray gun cleaning systems shall be made using South Coast Air Quality Management District "General Test Method for Determining Solvent Losses from Spray Gun Cleaning Systems" dated October 3, 1989.